BIG AND BAD

How the S.U.V. ran over automotive safety.

BY MALCOLM GLADWELL

In the summer of 1996, the Ford Motor Company began building the Expedition, its new, full-sized S.U.V., at the Michigan Truck Plant, in the Detroit suburb of Wayne. The Expedition was essentially the F-150 pickup truck with an extra set of doors and two more rows of seats—and the fact that it was a truck was critical. Cars have to meet stringent fuel-efficiency regulations. Trucks don't. The handling and suspension and braking of cars have to be built to the demanding standards of drivers and passengers. Trucks only have to handle like, well, trucks. Cars are built with what is called unit-body construction. To be light enough to meet fuel standards and safe enough to meet safety standards, they have expensive and elaborately engineered steel skeletons, with built-in crumple zones to absorb the impact of a crash. Making a truck is a lot more rudimentary. You build a rectangular steel frame. The engine gets bolted to the front. The seats get bolted to the middle. The body gets lowered over the top. The result is heavy and rigid and not particularly safe. But it's an awfully inexpensive way to build an automobile. Ford had planned to sell the Expedition for thirty-six thousand dollars, and its best estimate was that it could build one for twenty-four thousand—which, in the automotive industry, is a terrifically high profit margin. Sales, the company predicted, weren't going to be huge. After all, how many Americans could reasonably be expected to pay a twelve-thousand-dollar premium for what was essentially a dressed-up truck? But Ford executives decided that the Expedition would be a highly profitable niche product. They were half right. The "highly profitable" part turned out to be true. Yet, almost from the moment Ford's big new S.U.V.s rolled off the assembly line in Wayne, there was nothing "niche" about the Expedition.

Ford had intended to split the assembly line at the Michigan Truck Plant between the Expedition and the Ford F-150 pickup. But, when the first flood of orders started coming in for the Expedition, the factory was entirely given over to S.U.V.s. The orders kept mounting. Assembly-line workers were put on sixty- and seventy-hour weeks. Another night shift was added. The plant was now running twenty-four hours a day, six days a week. Ford executives decided to build a luxury version of the Expedition, the Lincoln Navigator. They bolted a new grille on the Expedition, changed a few body panels, added some sound insulation, took a deep breath, and charged forty-five thousand dollars—and soon Navigators were flying out the door nearly as fast as Expeditions. Before long, the Michigan Truck Plant was the most profitable of Ford's fifty-three assembly plants. By the late nineteen-nineties, it had become the most profitable factory of any industry in the world. In 1998, the Michigan Truck Plant grossed eleven billion dollars, almost as much as McDonald's made that year. Profits were $3.7 billion. Some factory workers, with overtime, were making two hundred thousand dollars a year. The demand for Expeditions and Navigators was so insatiable that even when a blizzard hit the Detroit region in January of 1999—burying the city in snow, paralyzing the airport, and stranding hundreds of cars on the freeway—Ford officials got on their radios and commandeered parts bound for other factories so that the Michigan Truck Plant assembly line wouldn't slow for a moment. The factory that had begun as just another assembly plant had become the company's crown jewel.

In the history of the automotive industry, few things have been quite as unexpected as the rise of the S.U.V. Detroit is a town of engineers, and engineers like to believe that there is some connection between the success of a vehicle

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and its technical merits. But the S.U.V. boom was like Apple's bringing back the Macintosh, dressing it up in colorful plastic, and suddenly creating a new market. It made no sense to them. Consumers said they liked four-wheel drive. But the overwhelming majority of consumers don't need four-wheel drive. S.U.V. buyers said they liked the elevated driving position. But when, in focus groups, industry marketers probed further, they heard things that left them rolling their eyes. As Keith Bradsher writes in "High and Mighty"—perhaps the most important book about Detroit since Ralph Nader's "Unsafe at Any Speed"—what consumers said was "If the vehicle is up high, it's easier to see if something is hiding underneath or lurking behind it." Bradsher brilliantly captures the mixture of bafflement and contempt that many auto executives feel toward the customers who buy their S.U.V.s. Fred J. Schaafsma, a top engineer for General Motors, says, "Sport-utility owners tend to be more like 'I wonder how people view me,' and are more willing to trade off flexibility or functionality to get that." According to Bradsher, internal industry market research concluded that S.U.V.s tend to be bought by people who are insecure, vain, self-centered, and self-absorbed, who are frequently nervous about their marriages, and who lack confidence in their driving skills. Ford's S.U.V. designers took their cues from seeing "fashionably dressed women wearing hiking boots or even work boots while walking through expensive malls." Toyota's top marketing executive in the United States, Bradsher writes, loves to tell the story of how at a focus group in Los Angeles "an elegant woman in the group said that she needed her full-sized Lexus LX 470 to drive up over the curb and onto lawns to park at large parties in Beverly Hills." One of Ford's senior marketing executives was even blunter: "The only time those S.U.V.s are going to be off-road is when they miss the driveway at 3 A.M."

The S.U.V. boom happened when drivers decided to treat accidents as inevitable.

The truth, underneath all the rationalizations, seemed to be that S.U.V. buyers thought of big, heavy vehicles as safe: they found comfort in being surrounded by so much rubber and steel. To the engineers, of course, that didn't make any sense, either: if consumers really wanted something that was big and heavy and comforting, they ought to buy minivans, since minivans, with their unit-body construction, do much better in accidents than S.U.V.s. (In a thirty-five-m.p.h. crash test, for instance, the driver of a Cadillac Escalade—the G.M. counterpart to the Lincoln Navigator—has a sixteen-per-cent chance of a life-threatening head injury, a twenty-per-cent chance of a life-threatening chest injury, and a thirty-five-per-cent chance of a leg injury. The same numbers in a Ford Windstar minivan—a vehicle engineered from the ground up, as opposed to simply being bolted onto a pickup-truck frame—are, respectively, two per cent, four per cent, and one per cent.) But this desire for safety wasn't a rational calculation. It was a *feeling*. Over the past decade, a number of major automakers in America have relied on the services of a French-born cultural anthropologist, G. Clotaire Rapaille, whose speciality is getting beyond the rational—what he calls "cortex"—impressions of consumers and tapping into their deeper, "reptilian" responses. And what Rapaille concluded from countless, intensive sessions with car buyers was that when S.U.V. buyers thought about safety they were thinking about something that reached into their deepest unconscious. "The No. 1 feeling is that everything surrounding you should be round and soft, and should give," Rapaille told me. "There should be air bags

"Damn, I think I ate Plan B."

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everywhere. Then there's this notion that you need to be up high. That's a contradiction, because the people who buy these S.U.V.s know at the cortex level that if you are high there is more chance of a rollover. But at the reptilian level they think that if I am bigger and taller I'm safer. You feel secure because you are higher and dominate and look down. That you can look down is psychologically a very powerful notion. And what was the key element of safety when you were a child? It was that your mother fed you, and there was warm liquid. That's why cupholders are absolutely crucial for safety. If there is a car that has no cupholder, it is not safe. If I can put my coffee there, if I can have my food, if everything is round, if it's soft, and if I'm high, then I feel safe. It's amazing that intelligent, educated women will look at a car and the first thing they will look at is how many cupholders it has." During the design of Chrysler's PT Cruiser, one of the things Rapaille learned was that car buyers felt unsafe when they thought that an outsider could easily see inside their vehicles. So Chrysler made the back window of the PT Cruiser smaller. Of course, making windows smaller—and thereby reducing visibility—makes driving *more* dangerous, not less so. But that's the puzzle of what has happened to the automobile world: feeling safe has become more important than actually being safe.

One day this fall, I visited the automobile-testing center of Consumers Union, the organization that publishes *Consumer Reports*. It is tucked away in the woods, in south-central Connecticut, on the site of the old Connecticut Speedway. The facility has two skid pads to measure cornering, a long straightaway for braking tests, a meandering "handling" course that winds around the back side of the track, and an accident-avoidance obstacle course made out of a row of orange cones. It is headed by a trim, white-haired Englishman named David Champion, who previously worked as an engineer with Land Rover and with Nissan. On the day of my visit, Champion set aside two vehicles: a silver 2003 Chevrolet TrailBlazer—an enormous five-thousand-pound S.U.V.—and a shiny blue two-seater Porsche Boxster convertible.

We started with the TrailBlazer. Champion warmed up the Chevrolet with a few quick circuits of the track, and then drove it hard through the twists and turns of the handling course. He sat in the bucket seat with his back straight and his arms almost fully extended, and drove with practiced grace: every movement smooth and relaxed and unhurried. Champion, as an engineer, did not much like the TrailBlazer. "Cheap interior, cheap plastic," he said, batting the dashboard with his hand. "It's a little bit heavy, cumbersome. Quiet. Bit wallowy, side to side. Doesn't feel that secure. Accelerates heavily. Once it gets going, it's got decent power. Brakes feel a bit spongy." He turned onto the straightaway and stopped a few hundred yards from the obstacle course.

Measuring accident avoidance is a key part of the Consumers Union evaluation. It's a simple setup. The driver has to navigate his vehicle through two rows of cones eight feet wide and sixty feet long. Then he has to steer hard to the left, guiding the vehicle through a gate set off to the side, and immediately swerve hard back to the right, and enter a second sixty-foot corridor of cones that are parallel to the first set. The idea is to see how fast you can drive through the course without knocking over any cones. "It's like you're driving down a road in suburbia," Champion said. "Suddenly, a kid on a bicycle veers out in front of you. You have to do whatever it takes to avoid the kid. But there's a tractor-trailer coming toward you in the other lane, so you've got to swing back into your own lane as quickly as possible. That's the scenario."

Champion and I put on helmets. He accelerated toward the entrance to the obstacle course. "We do the test without brakes or throttle, so we can just look at handling," Champion said. "I actually take my foot right off the pedals." The car was now moving at forty m.p.h. At that speed, on the smooth tarmac of the raceway, the TrailBlazer was very quiet, and we were seated so high that the road seemed somehow remote. Champion entered the first row of cones. His arms tensed. He jerked the car to the left. The TrailBlazer's tires squealed. I was thrown toward the passenger-side door as the truck's body rolled, then thrown toward Champion as he jerked the TrailBlazer back to the right. My tape recorder went skittering across the cabin. The whole maneuver had taken no more than a few seconds, but it felt as if we had been sailing into a squall. Champion brought the car to a stop. We both looked back: the TrailBlazer had hit the cone at the gate. The kid on the bicycle was probably dead. Champion shook his head. "It's very rubbery. It slides a lot. I'm not getting much communication back from the steering wheel. It feels really ponderous, clumsy. I felt a little bit of tail swing."

I drove the obstacle course next. I started at the conservative speed of thirty-five m.p.h. I got through cleanly. I tried again, this time at thirty-eight m.p.h., and that small increment of speed made a dramatic difference. I made the first left, avoiding the kid on the bicycle. But, when it came time to swerve back to avoid the hypothetical oncoming eighteen-wheeler, I found that I was wrestling with the car. The protests of the tires were jarring. I stopped, shaken. "It wasn't

going where you wanted it to go, was it?" Champion said. "Did you feel the weight pulling you sideways? That's what the extra weight that S.U.V.s have tends to do. It pulls you in the wrong direction." Behind us was a string of toppled cones. Getting the TrailBlazer to travel in a straight line, after that sudden diversion, hadn't been easy. "I think you took out a few pedestrians," Champion said with a faint smile.

Next up was the Boxster. The top was down. The sun was warm on my forehead. The car was low to the ground; I had the sense that if I dangled my arm out the window my knuckles would scrape on the tarmac. Standing still, the Boxster didn't feel safe: I could have been sitting in a go-cart. But when I ran it through the handling course I felt that I was in perfect control. On the straightaway, I steadied the Boxster at forty-five m.p.h., and ran it through the obstacle course. I could have balanced a teacup on my knee. At fifty m.p.h., I navigated the left and right turns with what seemed like a twitch of the steering wheel. The tires didn't squeal. The car stayed level. I pushed the Porsche up into the mid-fifties. Every cone was untouched. "Walk in the park!" Champion exclaimed as we pulled to a stop.

Most of us think that S.U.V.s are much safer than sports cars. If you asked the young parents of America whether they would rather strap their infant child in the back seat of the TrailBlazer or the passenger seat of the Boxster, they would choose the TrailBlazer. We feel that way because in the TrailBlazer our chances of surviving a collision with a hypothetical tractor-trailer in the other lane are greater than they are in the Porsche. What we forget, though, is that in the TrailBlazer you're also much more likely to hit the tractor-trailer because you can't get out of the way in time. In the parlance of the automobile world, the TrailBlazer is better at "passive safety." The Boxster is better when it comes to "active safety," which is every bit as important.

Consider the set of safety statistics compiled by Tom Wenzel, a scientist at Lawrence Berkeley National Laboratory, in California, and Marc Ross, a physicist at the University of Michigan. The numbers are expressed in fatalities per million cars, both for drivers of particular models and for the drivers of the cars they hit. (For example, in the first case, for every million Toyota Avalons on the road, forty Avalon drivers die in car accidents every year, and twenty people die in accidents involving Toyota Avalons.) The numbers below have been rounded:

Make / Model	Type	Driver Deaths	Other Deaths	Total
Toyota Avalon	large	40	20	60
Chrysler Town & Country	minivan	31	36	67
Toyota Camry	mid-size	41	29	70
Volkswagen Jetta	subcompact	47	23	70
Ford Windstar	minivan	37	35	72
Nissan Maxima	mid-size	53	26	79
Honda Accord	mid-size	54	27	82
Chevrolet Venture	minivan	51	34	85
Buick Century	mid-size	70	23	93
Subaru Legacy/Outback	compact	74	24	98
Mazda 626	compact	70	29	99
Chevrolet Malibu	mid-size	71	34	105
Chevrolet Suburban	S.U.V.	46	59	105
Jeep Grand Cherokee	S.U.V.	61	44	106
Honda Civic	subcompact	84	25	109
Toyota Corolla	subcompact	81	29	110
Ford Expedition	S.U.V.	55	57	112
GMC Jimmy	S.U.V.	76	39	114
Ford Taurus	mid-size	78	39	117
Nissan Altima	compact	72	49	121
Mercury Marquis	large	80	43	123
Nissan Sentra	subcompact	95	34	129
Toyota 4Runner	S.U.V.	94	43	137
Chevrolet Tahoe	S.U.V.	68	74	141
Dodge Stratus	mid-size	103	40	143
Lincoln Town Car	large	100	47	147
Ford Explorer	S.U.V.	88	60	148
Pontiac Grand Am	compact	118	39	157
Toyota Tacoma	pickup	111	59	171
Chevrolet Cavalier	subcompact	146	41	186
Dodge Neon	subcompact	161	39	199
Pontiac Sunfire	subcompact	158	44	202
Ford F-Series	pickup	110	128	238

Are the best performers the biggest and heaviest vehicles on the road? Not at all. Among the safest cars are the midsize imports, like the Toyota Camry and the Honda Accord. Or consider the extraordinary performance of some subcompacts, like the Volkswagen Jetta. Drivers of the tiny Jetta die at a rate of just forty-seven per million, which is in the same range as drivers of the five-thousand-pound Chevrolet Suburban and almost half that of popular S.U.V. models like the Ford Explorer or the GMC Jimmy. In a head-on crash, an Explorer or a Suburban would crush a Jetta or a Camry. But, clearly, the drivers of Camrys and Jettas are finding a way to avoid head-on crashes with Explorers and Suburbans. The benefits of being nimble—of being in an automobile that's capable of staying out of trouble—are in many cases greater than the benefits of being big.

I had another lesson in active safety at the test track when I got in the TrailBlazer with another Consumers Union engineer, and we did three emergency-stopping tests, taking the Chevrolet up to sixty m.p.h. and then slamming on the brakes. It was not a pleasant exercise. Bringing five thousand pounds of rubber and steel to a sudden stop involves lots of lurching, screeching, and protesting. The first time, the TrailBlazer took 146.2 feet to come to a halt, the second time 151.6 feet, and the third time 153.4 feet. The Boxster can come to a complete stop from sixty m.p.h. in about 124 feet. That's a difference of about two car lengths, and it isn't hard to imagine any number of scenarios where two car lengths could mean the difference between life and death.

The S.U.V. boom represents, then, a shift in how we conceive of safety—from active to passive. It's what happens when a larger number of drivers conclude, consciously or otherwise, that the extra thirty feet that the TrailBlazer takes to come to a stop don't really matter, that the tractor-trailer will hit them anyway, and that they are better off treating accidents as inevitable rather than avoidable. "The metric that people use is size," says Stephen Popiel, a vice-president of Millward Brown Goldfarb, in Toronto, one of the leading automotive market-research firms. "The bigger something is, the safer it is. In the consumer's mind, the basic equation is, If I were to take this vehicle and drive it into this brick wall, the more metal there is in front of me the better off I'll be."

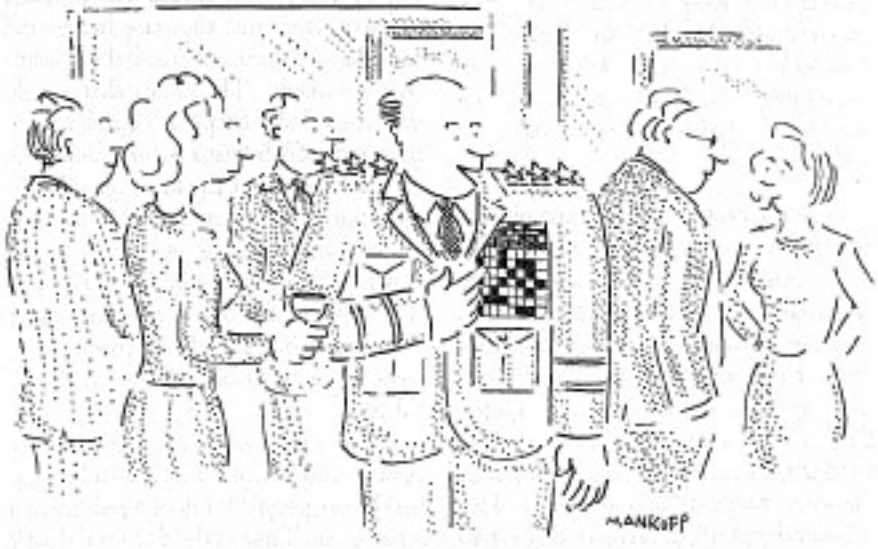
This is a new idea, and one largely confined to North America. In Europe and Japan, people think of a safe car as a nimble car. That's why they build cars like the Jetta and the Camry, which are

designed to carry out the driver's wishes as directly and efficiently as possible. In the Jetta, the engine is clearly audible. The steering is light and precise. The brakes are crisp. The wheelbase is short enough that the car picks up the undulations of the road. The car is so small and close to the ground, and so dwarfed by other cars on the road, that an intelligent driver is constantly reminded of the necessity of driving safely and defensively. An S.U.V. embodies the opposite logic. The driver is seated as high and far from the road as possible. The vehicle is designed to overcome its environment, not to respond to it. Even four-wheel drive, seemingly the most beneficial feature of the S.U.V., serves to reinforce this isolation. Having the engine provide power to all four wheels, safety experts point out, does nothing to improve braking, although many S.U.V. owners erroneously believe this to be the case. Nor does the feature necessarily make it safer to turn across a slippery surface: that is largely a function of how much friction is generated by the vehicle's tires. All it really does is improve what engineers call tracking—that is, the ability to accelerate without slipping in perilous conditions or in deep snow or mud. Champion says that one of the occasions when he came closest to death was a snowy day, many years ago, just after he had bought a new Range Rover. "Everyone around me was slipping, and I was thinking, *Yeahhh*. And I came to a stop sign on a major road, and I was driving probably twice as fast as I should have been, because I could. I had traction. But I also weighed probably twice as much as most cars. And I still had only four brakes and four tires on the road. I slid right across a four-lane road." Four-wheel drive robs the driver of feedback. "The car driver whose wheels spin once or twice while backing out of the driveway knows that the road is slippery," Bradsher writes. "The SUV driver who navigates the driveway and street without difficulty until she tries to brake may not find out that the road is slippery until it is too late." Jettas are safe because they make their drivers feel unsafe. S.U.V.s are unsafe because they make their drivers feel safe. That feeling of safety isn't the solution; it's the problem.

Perhaps the most troublesome aspect of S.U.V. culture is its attitude toward risk. "Safety, for most automotive consumers, has to do with the notion that they aren't in complete control," Popiel says. "There are unexpected events that at any moment in time can come out and impact them—an oil patch up ahead, an eighteen-wheeler turning over, something falling down. People feel that the elements of the world out of their control are the ones that are going to cause them distress."

Of course, those things really aren't outside a driver's control: an alert driver, in the right kind of vehicle, can navigate the oil patch, avoid the truck, and swerve around the thing that's falling down. Traffic-fatality rates vary strongly with driver behavior. Drunks are 7.6 times more likely to die in accidents than nondrinkers. People who wear their seat belts are almost half as likely to die as those who don't buckle up. Forty-year-olds are ten times less likely to get into accidents than sixteen-year-olds. Drivers of minivans, Wenzel and Ross's statistics tell us, die at a fraction of the rate of drivers of pickup trucks. That's clearly because minivans are family cars, and parents with children in the back seat are less likely to get into accidents. Frank McKenna, a safety expert at the University of Reading, in England, has done experiments where he shows drivers a series of videotaped scenarios—a child running out the front door of his house and onto the street, for example, or a car approaching an intersection at too great a speed to stop at the red light—and asks people to press a button the minute they become aware of the potential for an accident. Experienced drivers press the button between half a second and a second faster than new drivers, which, given that car accidents are events measured in milliseconds, is a significant difference. McKenna's work shows that, with experience, we all learn how to exert some degree of control over what might otherwise appear to be uncontrollable events. Any conception of safety that revolves entirely around the vehicle, then, is incomplete. Is the Boxster safer than the TrailBlazer? It depends on who's behind the wheel. In the hands of, say, my very respectable and prudent middle-aged mother, the Boxster is by far the safer car. In my hands, it probably isn't. On the open road, my reaction to the Porsche's extraordinary road manners and the sweet, irresistible wail of its engine would be to drive much faster than I should. (At the end of my day at Consumers Union, I parked the Boxster, and immediately got into my own car to drive home. In my mind, I was still at the wheel of the Boxster. Within twenty minutes, I had a two-hundred-and-seventy-one-dollar speeding ticket.) The trouble with the S.U.V. ascendancy is that it excludes the really critical component of safety: the driver.

In psychology, there is a concept called learned helplessness, which arose from a series of animal experiments in the nineteen-sixties at the University of Pennsylvania. Dogs were restrained



"And this is a crossword puzzle I'm working on."

by a harness, so that they couldn't move, and then repeatedly subjected to a series of electrical shocks. Then the same dogs were shocked again, only this time they could easily escape by jumping over a low hurdle. But most of them didn't; they just huddled in the corner, no longer believing that there was anything they could do to influence their own fate. Learned helplessness is now thought to play a role in such phenomena as depression and the failure of battered women to leave their husbands, but one could easily apply it more widely. We live in an age, after all, that is strangely fixated on the idea of helplessness: we're fascinated by hurricanes and terrorist acts and epidemics like SARS—situations in which we feel powerless to affect our own destiny. In fact, the risks posed to life and limb by forces outside our control are dwarfed by the factors we can control. Our fixation with helplessness distorts our perceptions of risk. "When you feel safe, you can be passive," Rapaille says of the fundamental appeal of the S.U.V. "Safe means I can sleep. I can give up control. I can relax. I can take off my shoes. I can listen to music." For years, we've all made fun of the middle-aged man who suddenly trades in his sedate family sedan for a shiny red sports car. That's called a midlife crisis. But at least it involves some degree of engagement with the act of driving. The man who gives up his sedate family sedan for an S.U.V. is saying something far more troubling—that he finds the demands of the road to be overwhelming. Is acting out really worse than giving up?

On August 9, 2000, the Bridgestone Firestone tire company announced one of the largest product recalls in American history. Because of mounting concerns about safety, the company said, it was replacing some fourteen million tires that had been used primarily on the Ford Explorer S.U.V. The cost of the recall—and of a follow-up replacement program initiated by Ford a year later—ran into billions of dollars. Millions more were spent by both companies on fighting and settling lawsuits from Explorer owners, who alleged that their tires had come apart and caused their S.U.V.s to roll over. In the fall of that year, senior executives from both companies were called to Capitol Hill, where they were publicly berated. It was the biggest scandal to hit the automobile industry in years. It was also one of the strangest. According to federal records, the number of fatalities resulting from the failure of a Firestone tire on a Ford Explorer S.U.V., as of September, 2001, was two hundred and seventy-one. That sounds like a lot, until you remember that the total number of tires supplied by Firestone to the Explorer from the moment the S.U.V. was introduced by Ford, in 1990, was fourteen million, and that the average life span of a tire is forty-five thousand miles. The allegation against Firestone amounts to the claim that its tires failed, with fatal results, two hundred and seventy-one times in the course of six hundred and thirty billion vehicle miles. Manufacturers usually win prizes for failure rates that low. It's also worth remembering that during that same ten-year span almost half a million Americans died in traffic accidents. In other words, during the nineteen-nineties hundreds of thousands of people were killed on the roads because they drove too fast or ran red lights or drank too much. And, of those, a fair proportion involved people in S.U.V.s who were lulled by their four-wheel drive into driving recklessly on slick roads, who drove aggressively because they felt invulnerable, who disproportionately killed those they hit because they chose to drive trucks with inflexible steel-frame architecture, and who crashed because they couldn't bring their five-thousand-pound vehicles to a halt in time. Yet, out of all those fatalities, regulators, the legal profession, Congress, and the media chose to highlight the .0005 per cent that could be linked to an alleged defect in the vehicle.

But should that come as a surprise? In the age of the S.U.V., this is what people worry about when they worry about safety—not risks, however commonplace, involving their own behavior but risks, however rare, involving some unexpected event. The Explorer was big and imposing. It was high above the ground. You could look down on other drivers. You could see if someone was lurking behind or beneath it. You could drive it up on someone's lawn with impunity. Didn't it seem like the safest vehicle in the world? ♦